

From: [Gregory Orehowsky](#)
To: [victor.a.schneider@Cummins.com](#)
Cc: [robert.a.jorgensen@Cummins.com](#); [Khesha.Jennings@EPA](#); [ychang@arb.ca.gov](#)
Bcc: [Karl Simon](#)
Subject: Re:2007 DFs and AECD document
Date: 03/24/2006 03:56 PM

I will pencil in 12-3:00 for AECDs on Tuesday.

Firetrucks- if nothing has changed from the previous year, this will be OK. If you need additional protection, we need to talk. I will respond to your e-mail on this topic.

DFs

I talked to Khesha and we have major concerns about your entire DF plan

Crankcase emissions

CBI/ Ex. 4 for the 6.7L and presumably other engines. There are no provisions in the regulation for calculating DFs. DFs are measured values.

Carry-across of DFs to various emission levels

A number of Cummins engine models will be certified at NOx levels ranging from 2.5 to 1.2 g/bhp-hr. Separate DF engines will likely be required for a 2.5 engine and 1.2 g/bhp-hr engine. We believe the changes in engine design required to get to a 1.2 g/bhp-hr level may cause greater deterioration than seen on 2.5 gram engines. Also, engine at levels between 2.5-1.2 may have unique deterioration as well.

Aging of DPFs

The DPF data presented in our last meeting was obtained using a 6.7 liter engine. Cummins should be prepared to explain why this is the worst case engine for aging the DFs. Does the type of dosing system effect trap durability?

6.7L engines

Although the crankcase DF may make this a moot point, engine out DFs are the average of the three DF engines after negative DFs are set to zero or one as appropriate. Multiplicative DFs for this engine should be NOx 1.053, PM 1.150, HC 1.233, CO 1.285

DFs must all be either additive or multiplicative. You can not choose to HC as additive and the rest multiplicative.

6.7L or 5.9L DFs should not be carried across to 8.3L or 8.9L engines. Typically in-cylinder displacement should not vary by more than 15%.

We understand that our concerns will likely require substantially more DF testing than you had originally planned. We can work with you to get 2007 product certified. This will likely require some DF testing this year with the remainder the following year.

Please contact me to set up a meeting to discuss your 2007 DF plans

Greg Orehowsky
Compliance and Innovative Strategies Division
Office of Transportation and Air Quality
Phone: 202-343-9292
Fax: 202-343-2804